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THE CHRONICLE
of Early American Industries

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Primitive Lighting in America

From a talk given at the EAIA sessions of the Cooperstown Seminar, July, 1948, based on information obtained from the files of THE RUSHLIGHT

MALCOLM WATKINS

The settlers of the coastal colonies brought with them memories of cultivated European surroundings. They were familiar with a variety of lighting devices, ranging in design from the crude to the elaborate. There were recollections of pine splints, torches and fire baskets, all used generally in Europe. Crusiform lamps had been seen virtually everywhere: the double crusie of iron, copper, brass, and tin was known in slight variations all along the western European coasts, while the so-called "betty" lamp (crusie with wick support) was universally recalled. The spout lamp was remembered particularly by the Dutch settlers. Candles had been used in all countries by those who could afford them and in Britain a related device was the fat-soaked rush, burned either in a clip-like utensil or on the edge of a table or chest cover.

Besides knowledge of these things, the early colonists brought examples with them; but so far as the making of lighting devices here is concerned there was a distinct retrogression. This may be attributed to limitations on skill, time, and material: there was always too much to do and too little to do with. Thus the settler reverted to rudimentary technological levels, in lighting perhaps more than in other colonial arts.

It is logical to suppose that seventeenth-century colonists turned first to the pine splint and the torch in the absence of suitable fuels and sufficient lighting devices. This is borne out by ample literary evidence. In 1630 Francis Higginson wrote in *New England's Plantations*:

"Yea, our pine trees, that are the most plentiful

Continued on Page 157

Dating Old Buildings

by LORING MCMILLEN

II — *Wood*

In studying the frame house, we find that it was still being constructed in the countries from which our first settlers came. However, as a result of the depletion of the forests in the lowlands, we find the Dutch, the French and the Germans more versed in the construction of masonry buildings, whereas the English, with some forest reserves, were still accustomed to erecting frame buildings.

As far as I have been able to determine, the construction methods employed by the carpenters of each nationality were nearly identical and it was only in architectural details that variations occur; as for example, the frame house of New England has no resemblance to the frame house of the Hudson Valley or farther north, although the method of joining is the same.

In the New World, timber was framed at the building site or nearby, and prior to 1790-1800 each building member was hewn from a log nearest in size to the desired dimension so as to make the smallest amount of cutting. For this cutting or hewing, the broad axe with one perfectly flat side and a cutting edge sharpened like a chisel was used. This axe and the ordinary felling axe in the hands of a skilled artisan were all that were needed to square and smooth a log for use. The adze, often accredited for the smoothing of the surfaces of a beam was never used for this purpose, but when used at all by the house carpenter was employed to level the upper surfaces of joints for the more even laying of the floor boards.

The method of framing a building is ages old and is still practiced in some sections in barn construction. It has not been used since about 1870-80 for house construction. After hewing to the required size, all members were cut to length and joined to-

gether on the ground by the mortise and tenon method, secured by one or more wooden pins or treenails. To insure that no member would be separated from its component and would take its place in the erected framework of the building, the carpenter joiner marked the outside of each member close to the joint with a Roman numeral, beginning with I and working usually right to left along one face of the building, repeating the same numerals on the opposite side. Usually these marks were made with the one or two inch chisel, but often a small tool called a scribe was used. This had a small steel blade set in a handle which, with a scratching movement, cut the necessary numerals. The use of this tool caused this method of construction to be named the "scribe rule" as distinguished from the "square rule" which followed. The latter method has been used since mortise and tenon framing went from general practice about 1870. This method, used today, by which the carpenter saws each member to proper length on a line indicated by his "square," is familiar to us all. Since there is no mortise and tenon to be fitted, as only nails are used for fastening, each member today can be placed in position as soon as cut.*

When the frame was completed on the ground, the sides were assembled and raised into place on the sill of the foundation walls. The other members, floor joists and roof plates were then added. Roof rafters, usually first assembled as a simple "A" frame, were finally raised upon the plates and the house was ready for covering. Numerous are the accounts of the old house or barn "raisings" of former years. Only a few years ago I was fortunate to chance upon one in the French-Canadian section east of Quebec where this practice seems still to be continuing. Here 40 to 50 men and boys swarmed about the laid out hewn framework of a barn and at the shouted directions of a master carpenter carried and erected in a few hours the entire framework of the barn.

In dating framework, the following can be used as a guide. In the earliest work, oak was almost universally used, with the gradual substitution of other wood, particularly the softer varieties such as pine and whitewood. At first members were exceptionally large, indicating little understanding or regard for what was necessary for strength. About 1770 members became smaller in cross section, particularly floor joists which in the early examples were nearly square in cross section. These now gradually assumed greater depth in relation to width. Spacing between joists and posts diminished from 44 inches in Colonial days to 24 inches about 1830. The most significant change took place about 1790 when sawed timber began to take the place of hewn, at first in studding and bracing, but finally in the larger members as well.

Probably the most interesting operation in building following the erection of the frame took place immediately after the shingles or clapboards were placed. Stakes, either split or whole saplings about 2 inches thick, were slipped horizontally into grooves formed by two small strips nailed to each side of a post. Clay mixed with straw or salt marsh hay was packed about the stakes filling the space between the posts with a solid wall insulation, which was plastered over for the wall covering within. This process was called "daubing" and was identical with the same process used in erecting the half-timbered houses of Europe, with the clapboards omitted and the outer surface whitewashed. Records exist attesting that the "half-timbered house" was erected in this country in the early days. However, the scarcity of lime and the abundance of wood, together with the more rigorous climate of America soon discouraged the erection of such buildings. About 1790, in the New York area, bricks began to be used instead of clay for wall filling, although examples are known earlier. By 1870, this construction ceased entirely, only to be revived in recent years by substituting patent wall insulating material for brick.

Clapboards and shingles have been mentioned as the usual covering for the sides of the frame house. Both were used from the earliest times, often in combination, shingles on the north and east since they gave better protection, and clapboards on the south and west, or often, as when the home faced south, clapboarded only on the front, since clapboards with their beaded or molded edges were more attractive. In New England clapboards were narrow and thin, made of oak and later white pine. In New York early clapboards were much wider of random widths, as wide as 12 inches, with a beaded edge. By 1790 these were narrower and the beaded edge, so popular as an edge molding during colonial times, had become an ovolo (quarter round) or cyma molding.

The earliest shingles, or shakes, were of oak, of which no examples have survived to the author's knowledge. Very early, however, white cedar and white pine were used, three feet being the usual

length of the shingle. These were random width ¾ inch thick at the butt and hand riven. Before 1780 shingles were often "buttered," that is butt trimmed in the shape of a circle or three sided. These were nailed both at the butt and in the length to riven oak furring strips. After 1800 these strips were power sawed and following 1840-50 shingles were also.

Boards for flooring were at first of oak, but very early of white pine. Before the general introduction of power sawing, about 1790, they were hand sawed. Hand sawing can be recognized by the irregular kerf marks left by the ancient two man pit saw. Boards were joined by tongue and groove or by a slip joint—a piece of wood slipped into the grooves of two joined boards. By 1800 floor boards became narrower and usually of one width, which permitted alternate breaking of joints. In old flooring of random widths, as much as 20 inches had to be broken over the same joist to prevent wastage.

Earliest roof coverings were clapboards and shingles. Thatch, which was occasionally used, was used as late as 1800 in covering barns. Tiles were used only on the better buildings at early dates, and it is believed no early examples of any of these coverings exist today. Shingles became the universal roof covering in the same sizes as those used for wall covering. The three foot shingle seems to have been more popular before 1780 and the 27 inch length thereafter.

With structural details, belong those simple articles of joining called builders' hardware. Chief among these is the lowly nail and its less frequently used cousin, the screw. Contrary to popular belief, the iron nail is nearly as old as frame building itself. The expression referring to a building as being constructed without a nail is only partly correct, for only the framework was thus constructed. All the superficial covering of clapboards, shingles, lath and trim were fastened with iron nails.

The nail has been the object of much descriptive writing and I will not therefore linger upon this interesting subject. Prior to about 1790 nails were made by hand and their simple outline can easily be recognized by the sharp point and finely tapered shank with irregular hammered sides, and the head beaten into many shapes — each with its purpose and name. Like the sturdy oak tree, there were over 300 varieties of nails, each with its name and purpose, such as the "Rose Sharp," "Fine Rose," "Flat Point Rose," "Clasp," "Clout," "Fine Dog," etc.

Following 1790 machines were invented which made the shank of the nail, leaving the head still to be hand fashioned as formerly. By 1825 the entire nail was machine made and for years the "cut nail" as it was called was the standard nail for all general use and can be recognized by its regular flat sides, blunt point and flat head. The present wire nail came into general use following 1890.

Iron screws were used only to fasten butt hinges and other hardware. Prior to 1846 these were pointless and before about 1800 hand made. Butt hinges were cast iron and came into use following 1780. By 1820 they had replaced the strap and "H" or "HL" hinge for interior use. Wooden case locks with wrought iron works precede 1780 and between this date and 1820 the wrought iron case lock was in general use. These were rim locks, that is, applied to the surface of the door. Mortised, or built in locks, began to be used as early as 1810 and from this date, or somewhat later, the cast iron lock begins to appear. Latches were at first of the Suffolk type, that is open handle, and the Norfolk type of handle fastened to a plate came into general use about 1810-20.

Probably no trade, no industry, has shown so little change during the centuries that has fulfilled the needs of mankind, as the art of building. From foundation to roof, from timbered frame to finished trim, the story is the same: stone by stone, brick by brick, timber by timber they are fitted into place — one by one — with the same age old tools, the mason's trowel, the carpenter's hammer and saw, each fulfilling the same function as formerly. Only in the substitution of materials and the conveniences within the house has there been change. If the ancient carpenter were to return today, he could take up his old trade after a short period of adjustment by the side of his modern fellow workman.

*The balloon frame, which involved the substitution of thin plates and studs, running the entire height of the building and held together only by nails, for the older method of mortised and tenoned joints. Invented apparently by George Snow in Chicago in the early 1830s it marks the penetration of industrialization into housing. Its invention coincides with the improvement of sawmill machinery as well as with the mass production of nails.—Ed.

Horse Whips

by MARY MOORE

It is true that men had always cut themselves whips of hickory or white oak to speed up the ox and horse-drawn vehicles. (Just as boys have cut themselves fishpoles.)

But in 1810 a man, said to have been actually named JO JOKES, first produced whips for commercial use. He too selected hickory sticks. But before attempting to sell them, he put on the end of each a lash made of horse hide. (It seems a bit strange that horses had to be speeded up by a forcible application of a piece of their own skin.)

A Mr. Socket is said to have been the first to have made a business of tanning white horse hair for lashes. And — as often — the Shakers of Lebanon, masters of craftsmanship, had a better way. The Shakers produced the lashes by stripping. (Stripping means taking off in layers — like peeling layers of bark from some trees.) Sometimes the lashes were smoothed and rolled in white soap.

As whips improved, the braiding of lashes was an important operation. Often this was done by the women of Westfield, Massachusetts in their own homes. At one time Westfield made 90% of all the manufactured whips of the entire world.

Each day when mothers finished braiding the long pigtails of their little daughters and had sent them off to school, they could earn quite a bit toward cloth for a dress by simply braiding pieces of leathers. The bundle of completed lashes was taken to the store and traded out by credit. Today some of Westfield's leading men boast that the foundation of their family's financial standing was built on this piecework done by their grandmothers.

Not only in New England did women manufacture in the home. An elderly lady told me that in Pennsylvania on her father's farm she and her sisters always made the long lashes for the ox whips. They made them of old worn out leather boots which they cut into strips. In the end of each strip a slit was cut, through which the next strip was hitched. She complained that the end lengths were very short but nothing that could possibly be used was discarded.

Years afterwards these little girls with pigtails now pinned decorously about their heads, worked in the whip factories, either in the offices or along the production lines. Indeed, twenty years after the whip was first marketed four hundred and fifty women were employed in the Westfield factories.

It is seldom that the construction of a whip is correctly described. It is difficult to convince anybody in New England that *their* grandfather used *anything* but a GENUINE WHALEBONE whip. It is a point of family honor, like passage on the Mayflower.

Perhaps masculine pride in quality made a man go to the harness shop where he believed only whalebone whips were carried. He *asked* for whalebone and the Yankee salesman only *spoke* of whalebone like ALL WOOL and PURE SILK. The *right* whale wore an upper plate. It was of soft springy substance. A springiness not only suitable for whips, but also an aid in confining feminine flesh to still narrower restricted areas. Soon the demand for these *right* whales exceeded the supply.

Whale oil for illumination went from 12c a gallon to 75c, so some Yankees began making lard oil lamps in quantities. Down in Bridgeport, Conn., the Drs. Warners, who manufactured corsets, were experimenting with a Mexican cactus, as plentiful as the whale was scarce.

In Westfield, the industry that had originally paid 25c a pound for whalebone at the peak of their production in 1910 finally paid $10.00 a pound. $100.00 for a bundle of whalebone! So Westfield men began to substitute rawhide for the center of their whips at one-half the price of whalebone. This was called the "Twisted Whip." The green rawhide came from South America and India. Some of it from the water buffalo we see in our newsreels and zoos.

It was tanned, cut heavier at one end, twisted and allowed to dry. It was then unevenly round and about as big as a lead pencil. Through a machine it was rounded. (The scraps and dust from this process were salvaged to make glue. One firm was buying 100 tons of glue annually.)

Next came coats of filler, cornstarch or such. Two or three coats.

Then an experienced workman took out the jumps. The whip at this stage might look straight to the average man but to the experienced tester who took it in his hand and arched it, there might be jumps in it, if it did not arch evenly. And he knew at once where the jumps were and with his hand planes removed them.

At last the whip was ready for the covering to be braided on. The braiding machine was a primitive affair. The whip was held above a barrel by means of a pulley and weight. Around the outside of the

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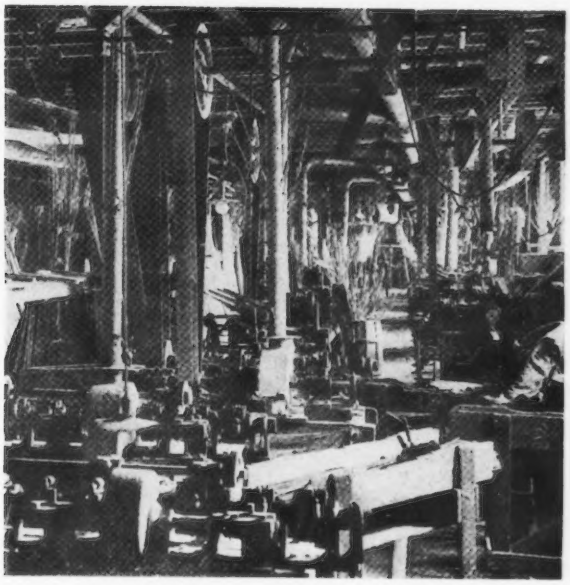
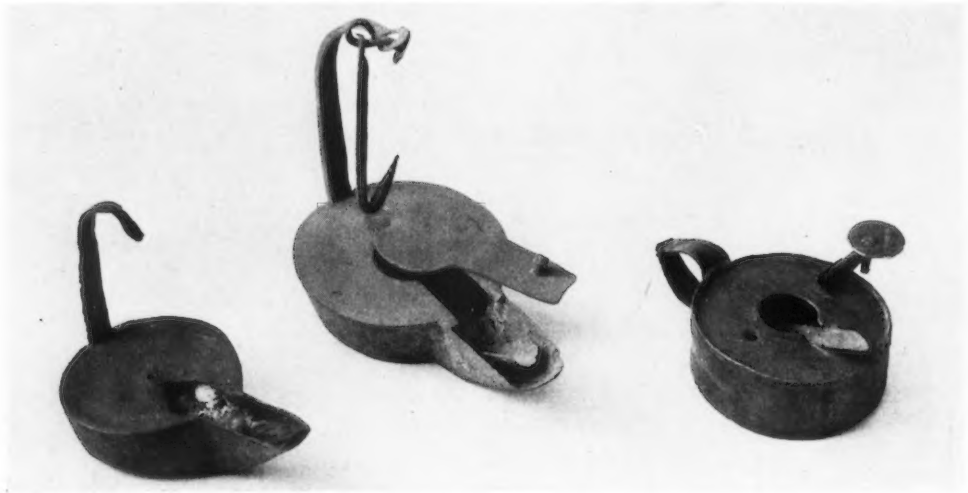


Machines for Rounding Rawhide

Westfield Factory of the U. S. Whip Co.

1. Group of "Slut" Lamps

Cast-iron lamp from Ohio. C. 1830. (William A. Dick, Jr., coll.)
Cast-iron baker's lamp. Probably 19th century. (Mrs. William C. H. Brand coll.)
Wrought-iron lamp. New Hampshire, 18th century. (Charles L. Woodside coll.)



2. Crusies with wick supports, or "Betty" lamps

Wrought-iron. Used by early 19th century pioneer family in Quincy, Illinois. (Glen E. Toalson coll.)
Typical form used in early colonial period. (F. E. Gage coll.)
German type of hand lamp. Used in Ohio. Early 19th century. (Charles L. Woodside coll.)

Lamps in the 1935 Rushlight Club Exhibition
Boston Public Library

Lighting in America — Continued

> of all wood, doth allow us plenty of candles, which are very useful in a house, and they are such candles as the Indians commonly use, having no other: and they are nothing else but the wood of the pine tree cloven in to little slices something thin, which are so full of the moisture of turpentine and pitch that they burn clear as a torch."

Four years later Josselyn reported in *Two Voyages*:

> "Knots of fir trees and fat pine are used by the English instead of candles and will burn a long time, but it makes people pale."

William Wood commented in 1642:

> "Out of these Pine is gotten the candlewood that is so much spoken of, which may serve for a shift amongst poore folkes, but I cannot commend it for a singular good, because it is something sluttish, dropping a pitchy kind of substance where it stands."

Wood's condescending attitude was probably typical of the well-to-do, who even in the early period could afford imported candles. But it is apparent that "poore folkes" for many years had little choice but to use splints. John Winthrop later commented that pine splints were much used in New England, Virginia, and by the Dutch, stating also that they were usually burned on a flat stone or iron in the corner of the room. There is likewise evidence that candlewood was used in the Connecticut Valley until the end of the colonial period, while it has been employed in the South until recently.

The torch was the out-door counterpart of the splint, differing in that it required a utensil known as a *cresset* or *fire basket*. A cresset is recorded in the Essex County (Massachusetts) Probate Records of the Seventeenth Century, and we know the light of the Pt. Allerton lighthouse emanated from pitch and oakum burned in a cresset. The Boston Beacon was a huge iron basket that held a barrel of tar. Cressets were used well into the nineteenth century to light the decks of ships, Melville having described the burning of scraps of blubber aboard a whaling ship. From Mark Twain we learn of similar devices used presumably with pine knots to illuminate Mississippi and Ohio River steamship landings. A recent vestigial use of cressets was for night fishing, and it is not unlikely that these may still be seen mounted on the bows of rowboats in areas of backward development.

Regarding lamps, as early as 1621 Edward Winslow advised newcomers to Plymouth to bring "cotton yarn for your lamps." One may conjecture that he referred to crusiform lamps, although the Pilgrims may have brought Dutch spout lamps from Leyden. In 1630 Higginson's account states that "by the abundance of fish thereof (New England) can afford oil for lamps." The Essex County Probate Records list numerous lamps, and occasionally specify their being of brass, latten, tin, or iron. Besides these materials, the New York records of the period also list "earthen" lamps.

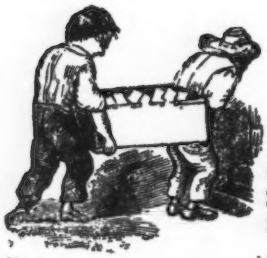
Inland from the coast fish oil was unavailable, and the only fuel for lamps was kitchen fat, pure tallow having as a rule been saved for making candles. Thus, the lamp, at best an unfragrant device, degenerated into a malodorous abomination. It was relegated to the kitchen to hang by the fireplace. As time went on the lamp retrogressed in form, and we find "grease" lamps made by country iron workers, who from lack of skill or time, produced them in only rudimentary form. These were known as "sluts," the unsavory connotation being obvious. A "slut" is listed in the Essex County Probate Records, indicating early use of crude lamps in the colonies. On the more recent frontier the name was applied not only to actual grease lamps, but also to makeshifts such as saucers with rag wicks.

Generally speaking, the lamp was unpopular during the colonial period. Only among the Pennsylvania Germans was it widely adopted and retained, isolated examples of primitive types having still been made early in this century.

There seems to be no written evidence of the colonial use of rushlights or rush holders, although there is sufficient circumstantial data to suggest their early presence here. Rush candles were advertised in the late eighteenth century in Boston, but these are not to be confused with fat-soaked rushes associated with the little iron holders. Negroes were using rushes as late as the Civil War, as were nineteenth-century British immigrants. But if rushes occurred in the colonies it is likely that they were most often burned as Winthrop reported splints to have been used — on a flat stone — or else simply on the edge of a table or chest.

The first candles used in the English colonies were imported, and in New England were sold by the Massachusetts Bay Company. We know from Higginson that there was no tallow to make candles of because of the scarcity of cattle, a condition lasting

Concluded on Page 160



The Chronicle

Issued occasionally for members of
EARLY AMERICAN INDUSTRIES ASS'N

The purpose of the association is to encourage the study and better understanding of early American industry, in the home, in the shop, on the farm, and on the sea, and especially to discover, identify, classify, preserve and exhibit obsolete tools, implements, utensils, instruments, vehicles, appliances and mechanical devices used by American craftsmen, farmers, housewives, mariners, professional men and other workers.

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Communications regarding the contents of The Chronicle should be addressed to the Editor; Suggestions for members and other matters either to the President or the Secretary-Treasurer.

MEMBERSHIP: Regular members contribute $2.00 annually.
Supporting Mem bers contribute $5.00 or more a year.

BACK NUMBERS of The Chronicle are available in some instances for fifty cents or one dollar, depending on rarity. Index to Volume I and II is available for one dollar each.

Editor's Note

The Editor is indebted to Sigfried Giedion, secretary of the Congrès Internationaux d'Architecture Moderne for the note on the balloon frame. The impact of this entry of industrialization in house building and it being an outstanding contribution of the United States to Architecture in the 19th Century is hardly realized. Possibly a more extended article on this subject may appear later in *The Chronicle*.

Back issues of *The Chronicle* have now been placed in the custody of Loring McMillen at the Staten Island Historical Society, Richmond, Staten Island. Eleven old numbers of Volume I and six of Volume II are now no longer available. Others are near exhaustion. A detailed accounting of these will be given in the next issue.

Mrs. Pierce reports that questionnaires have been coming in from members in such numbers that the data is being prepared for printing in a small book to carry handily in one's pocket or purse. Any who haven't sent back their questionnaires are urged to do so.

New Members

CALIFORNIA

Bakersfield: **Latta**, Frank F. (1481) (N)
Latta, Mrs. Frank F. (1482) (N)
Sierra Madre: Nash, Robert A. (1488) (N)

ILLINOIS

Carbondale: **Allen**, John W. (1514) (N)
Champaign: Redhead, W. S. (1535) (N)

MASSACHUSETTS

Boston: **Cooke**, Dr. John W. (1512) (N)
Cambridge: **Doble**, Frank C. (1508) (N)
Doble, Mrs. Frank C. (1509) (N)
Clinton: **Wood**, Mrs. Amy L. (1491) (N)
Paxton: **Brady**, Charles F. (1483) (N)
Brady, Mrs. Charles F. (1484) (N)
Shrewsbury: **Harlow**, Hiram (1486) (N)
Westboro: **Dearing**, Mrs. C. M. (1489) (N)
Worcester: **Tighe**, Benjamin (1485) (N)

NEW JERSEY

Hamburg: **Knapp**, Miss Dorothy J. (1492) (N)
Titsworth, Miss Julia W. (1501) (N)
Montclair: **Mutchler**, Miss Margaret H. (1504) (N)

NEW YORK

Albany: **Lassiter**, William L. (1494) (N)
Brooklyn: **Cossidente**, Dr. Alfred G. (1487) (N)
Cooperstown: **Campbell**, George P. (1503) (N)
Parslow, Miss Virginia D. (1495) (N)
Van Horne, Charles (1510) (N)
Ellicottville: **Laidlaw**, William K. (1493) (N)
Huntington: **Badetty**, Miss Emily E. (1496) (N)
Lyons Falls: **Trube**, Miss Sarah M. (1499) (N)
New York City: **Wilson**, Mrs. Arnold (1490) (N)
Queens Village: **Cummings**, Miss Kathryn F. (1497) (N)
Schenectady: **Cormack**, Mrs. L. S. (1502) (N)
Staten Island: **Stoddard**, Charles C. (1506) (N)
Williamsville: **Niederlander**, Daniel B. (1511) (N)

OHIO

Columbus: **Anderson**, Mrs. Irma P. (1500) (N)

Early American Industries

Milk Paint

From "The Domestic Encyclopedia" by A. F. M. Willich, published in Philadelphia in 1821.

"The danger to health, and other numerous inconveniences attending the common method of painting with white lead and oil, have induced several persons to propose various substitutes; among others, Cadet De Vaux has published a process, which, for cheapness and efficacy, appears to possess great advantages over the common methods. The way in which he prepares his paint is the following:—Take of skimmed milk two quarts (two Paris pints), fresh slacked lime six ounces and a half, linseed, caraway, or nut oil, four ounces, common whiting three pounds: put the lime into a stone-ware vessel, pour upon it a sufficient quantity of milk to make a mixture resembling thin cream. Then add the oil a little at a time, carefully stirring it to make it mix thoroughly: the remainder of the milk is then to be added; and lastly, the whiting is to be crumbled, and spread on the surface of the fluid, in which it gradually sinks; at this period it must be well stirred in, and the paint is fit for use. It is to be applied by a brush, in the same manner, and in a few hours will become perfectly dry.

"The quantity of paint above mentioned is sufficient for covering twenty-seven square yards with one coating.

"For outdoor work a much greater degree of solidity is given to the paint by increasing the proportion of lime to eight ounces and a half; of the oil to six ounces, and by adding two ounces of white Burgundy pitch. The pitch is to be melted by a gentle heat, in the oil, and then added to the smooth mixture of milk and lime."

"The Dyer's Companion" by Elijah Bemiss, published in New York in 1815 enlarges this description of the Cadet De Vaux process as follows:

"Skimmed milk, in summer, is often curdled; but this is of no consequence to our purpose, as its fluidity is soon restored by its contact with lime. It is, however, absolutely necessary that it should not be sour; for in that case it would form with the lime a kind of calcareous acetite, susceptible of attracting moisture.

"The lime is slacked by plunging it into water, drawing it out and leaving it to fall to pieces in the air. It is indifferent which of the three oils (above mentioned) we use; however, for painting white, the oil of carraway is to be preferred, as it is colourless.

Continued on Page 160

Horsewhips — Concluded

barrel were the bobbins. It took the time of several workmen to keep the bobbins moving. As the braiding progressed the whip could be pulled higher.

Beyond the tip of the whip an extra length of covering was braided and turned back into the body braid, leaving a loop, called the keeper, to fashion the lash to.

One to three coats of varnish were applied depending on the quality of the whip. It took two days to dry each coat. You could not hurry old fashioned varnish.

A man hurried back to his factory with an idea and soon a whip company bought the patent for the shoe-lace braiding machine for $1,000.00 and the old barrel and pulley and weight were discarded.

Henry Hull thought of rattan sliced from tip to root and the sections glued about the core of whalebone or twisted rawhide. Soon just one plant was using 600 tons of it annually. Westfield's great factories and warehouses needed huge piles of lumber for packing cases. A single company used 3,000,000 yards of cloth and 75 tons of thread. Other factories were added: one making whip lashes, one or two making whip buttons, one or two making mountings, three making braidings or plaitings, three making snaps, five making wooden butts. One making whip-making machinery!

Production was soon so speedy in the plaiting or braiding room that at the peak of whip manufacturing it was impossible to watch the process closely. A former manufacturer likened that part of his factory to hundreds of toy electric trams running at full speed all over the place, so intricately and exactly was the work done.

A harness maker, until recently doing business on Westfield Main Street, made the great leather cases in which samples were shipped. They looked like those in which symphony orchestras carry their harps. Smaller cases resembled our flat silver holders.

One firm had 12 salesmen. Another had fifty. One company offered 250 varieties. One carried eight different lengths.

As the motor age arrived, Westfield kept on making and selling whips but when adjustment was finally forced upon them, many of the 200 or more factories went out of business completely. One has turned to the manufacturing of fishlines.

Today Westfield is an airport center.

Communications

From J. Almus Russell, Bloomsburg, Penn.

Will you make correction in your next issue — the word for discovering water with a witch-hazel rod is DOWSING; not drowsing, as printed . . . The Editor regrets the extra "'r" in Dr. Russell's Witch-Hazel article! (Vol. III, No. 15.)

From Amos E. Jewett, Rowley, Mass.

What *is* the difference between a cobbler and a shoemaker? The shoemaker *makes* the shoe, the cobbler *repairs* the shoe. See Webster.

From Mary E. Eldredge, East Hampton, N. Y.

— Chronicle readers might send in names of books they have enjoyed and so interest others. The following books I have found to have good Early Industries material:

Candle Days .....Marion N. Rawson
Candleday Art .....Marion N. Rawson
Handwrought Ancestors .....Marion N. Rawson
(Also other books by same author)
Homespun Handicrafts .....E. S. Bowles
Everyday Things in American Life..W. C. Langdon
Early American Craftsmen.....Walter A. Dyer
Life of Margaret Winthrop.....Alice M. Earle
Home Life in Colonial Days.....Alice M. Earle
(In fact any of the other Earle books)
Children of the Handicrafts.....C. S. Bailey
(Betsey's New Hat in this is good)

Have our readers other suggestions? — Ed.

MILK PAINT -- Concluded

For painting the ochres, the commonest lamp oil may be used. The oil, when mixed with the milk and lime, disappears; being entirely dissolved by the lime, with which it forms a calcareous soap. The Spanish white must be crumbled, and gently spread upon the surface of the liquid, which it gradually imbibes, and at last sinks; it must then be stirred with a stick. This paint is coloured like distemper, with charcoal levigated in water, yellow ochre, etc. It is used in the same manner as distemper. The quantity above mentioned is sufficient for painting the first layer of six toises, or fathoms.

"For work out of doors I add to the proportions of the milk distemper painting, two ounces of slacked lime, two ounces of oil, and two ounces of white Burgundy pitch. The pitch is to be melted in oil by a gentle heat, and added to the smooth mixture of milk and oil. In cold weather the milk ought to be warmed to prevent its cooling the pitch too suddenly, and to facilitate its union with the milk of lime."

Lighting in America — Concluded

presumably until the close of the seventeenth century. Later, tallow-candle making became general as a home industry in rural communities.

In the seventeenth century it was discovered that the berry of the bay bush would yield an excellent candle wax. Peter Kalm, the Swedish naturalist who visited America in the mid-eighteenth century, wrote of it in 1758:

> "This tallow is dearer than common tallow, but cheaper than wax. From this tallow candles are made, but common tallow is usually mixed with it. Such candles do not easily bend and do not melt in summer. They burn better and slower, nor do they cause any smoke, but rather yield an agreeable smell when they are extinguished. These candles are made use of by poor people . . . who have not cattle enough to supply them with a sufficient quantity of ordinary tallow."

The rich also liked bayberry candles. In 1750 a Boston chandler advertised "Bay Berry Candles for Sale, large & small, plain & flowered." The price of such candles produced commercially must have included the high cost of picking the berries, and, of course, "flowered" candles were cast in fancy molds, all of which indicates a luxury market at that time.

There were many candlesticks and candle holders in the early colonies. In Essex County they were of brass, latten, pewter, and iron. In New York, besides these, there were wire candlesticks, probably of the sort often depicted by Dutch genre artists.

In eighteenth-century colonial towns the same elaboration of sconces, chandeliers, girandoles, and candlesticks flourished that could be found in contemporary English cities. The development of spermaceti-candle manufacture, an outgrowth of the American whaling industry, raised the candle to new levels of efficiency and public favor in urban communities after the middle of the century.

While this was occurring, however, the pine splint and the slut lamp were still among the simple resources and crude products of the pioneer. Skills on the frontier were diverted to the causes of bare survival which in turn engendered only necessary knowledge. The history of colonial lighting was therefore a down-hill course, except where the growth of towns and the advent of scientific research led to radical new developments after the Revolution.